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SUGHRUE, MION, ZINN,  
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Washington, DC 20037

EXAMINER

CURS, NATHAN M

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/919,830	<b>Applicant(s)</b> NAKAISHI, HIROSHI	
	<b>Examiner</b> Nathan Curs	<b>Art Unit</b> 2633	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 August 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/01, 7/04, 3/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 19 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 1, the applicant's amended claim states that the switch controlling information includes "VPI/VC1 on a cell header"; however the applicant's specification does not disclose and describe "VPI/VC1 on a cell header" with respect to switch controlling information.

Regarding claims 19 and 20, the applicant claims, "said ATM-PON contains a single system ONT partially, and said ONT does not process relevant signals even if receives switch confirmation requirement signals received from the OLT". This claim limitation is not disclosed or described in the specification, specifically, the specification does not define or describe "a single system ONT partially" or "ONT does not process relevant signals even if receives switch confirmation requirement signals received from the OLT".

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by ITU

G.983.1 [1998] (<http://crewman.uta.edu/~basu/5347spring2003/PON.pdf>).

Regarding claim 1, ITU G.983.1 disclose an ATM-PON (Asynchronous Transfer Mode Passive Optical Network) dual system (page i, Summary section and page 109, Figure IV.2: (c)) providing a reliable service by dualizing intervals between optical couplers and ONUs (Optical Network Units) (page 109, Figure IV.2 and pages 107-110, subsections IV.3.1, IV.3.2 and IV.4), comprising: a control information loading means which loads switch controlling information to a fixed area of a format transmitted and received between an OLT and the ONUs (page 110, subsection IV.4), said control information includes values of line numbers in a message field of a PLOAM cell (page 41, section 8.3.5.9); and a switch controlling means which switches to each of a VP or a VC on the basis of said switch controlling information (page 9, section 5.5, page 106, section IV.2 and figure IV.1, element VP/VC switch, and page 110, section IV.4); and where switching redirects the transmission of a failing line and does not disturb the transmission to ONUs having satisfactory transmission (page 41, section 8.3.5.8 and page 106, section IV.2 and Figure IV.1, where protection switching at the VP/VC level means switching VPs/VCs in need of protection, which is different from switching physical lines; as a result, ONUs using non-faulty VPs/VCs are not affected by a protection switch for a faulty VP/VC of another ONU).

Regarding claim 2, ITU G.983.1 discloses the ATM-PON dual system as claimed in claim 1, wherein said switch controlling means is characterized in deciding necessity of switching by referring to K1/K2 byte areas of a PLOAM (Physical Layer OAM) cell for a monitor transmitted and received between the OLT and the ONUs (page 41, section 8.3.5.9 where K1/K2 bytes used for performing switching indicates inherent monitoring of the switching bytes).

Regarding Claim 9, ITU G.983.1 discloses an ATM-PON dual method providing a reliable service, comprising the steps of: dualizing an interval between an optical coupler and an ONU (page 109, Figure IV.2 and pages 107-110, subsections IV.3.1, IV.3.2 and IV.4) and loading switch controlling information to K1/K2 byte areas of a PLOAM cell for a monitor, which is transmitted and received between an OLT and the ONU (page 41, section 8.3.5.9, where K1/K2 bytes for switching indicates inherent monitoring of the switching bytes); and switching a relevant VP or VC on the basis of said switch controlling information (page 9, section 5.5, page 106, section IV.2 and figure IV.1, element VP/VC switch, and page 110, section IV.4). ITU G.983.1 also discloses that the switch controlling information includes values of line numbers (page 41, section 8.3.5.9), and discloses line numbers of 0 and 1 (page 60, section "PST Message" and page 106, Figure IV.1).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over ITU G.983.1 [1998] (<http://crewman.uta.edu/~basu/5347spring2003/PON.pdf>).

Regarding claim 5, ITU G.983.1 discloses an ONU, which is used for an ATM-PON, being configured by dualizing the interval between said ONU and an OLT, comprising: two line termination devices which terminate each line at said ONU; a transmitting means which allocates signals from subscribers to said two line termination devices and transmits to said

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OLT; a receiving means which receives signals transmitted from the OLT at each line termination device; and a selector which selects either one of signals (page 106, section IV.2 and figure IV.1, element VP/VC switch, and page 109, Figure IV.2: (c)). ITU G.983.1 does not explicitly show a selector at the ONU for selection of one of the two signals present on the ONU line termination devices. However, since the system is a "protection switching" system between two lines, it would have been obvious to one of ordinary skill in the art at the time of the invention that the ONU would have a selector to select the appropriate one of the two lines based on the switching information to obtain the active signaling.

Regarding claim 6, ITU G.983.1 discloses the ONU as claimed in claim 5, further comprising a switch deciding means which decides necessity of switching the ONU according to existence of switch controlling information received at each line termination device from the OLT (page 41, section 8.3.5.9 and page 60, section "PST message", and page 106, section IV.2, and figure IV.1; page 107, section IV.3.1; and page 109, Figure IV.2: (c)).

7. Claims 3, 4, 7, 8 and 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over ITU G.983.1 [1998] (<http://crewman.uta.edu/~basu/5347spring2003/PON.pdf>) in view of Klink (US Patent No. 5706277).

Regarding Claim 3, ITU G.983.1 disclose an OLT, which is used for an ATM-PON, comprising a frame structuring means uses K1 or K2 byte of a message area within a PLOAM cell (page 41, section 8.3.5.9, page 106, section IV.2 and figure IV.1, element VP/VC switch, and page 110, section IV.4), and a switch requirement transmitting means which requires line switch of ONUs by using K1/K2 bytes (page 41, section 8.3.5.9). ITU G.983.1 discloses that the K1/K2 bytes are used as specified in G.783 for protection switching, but does not explicitly disclose that the K1 or K2 bytes are loaded with SC (Switch Confirmation requirement) signals

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and SR (Switch Requirement) signals. Klink discloses that ITU-T G.783 teaches the K1/K2 bytes used for protection switching, including a switching process between two terminals where altered K1/K2 bytes must be transmitted three times in succession between the two terminals for coordinating the switching (col. 1, lines 31-38). It would have been obvious to one of ordinary skill in the art at the time of the invention that the three successive K1/K2 transmissions defined in ITU-T G.783, as applicable to ITU G.983.1, would correspond to using a switch confirmation requirement signal, followed by a response to the switch confirmation requirement signal, followed by a switch requirement signal, between the OLT and ONU of the K1/K2 switching bytes of the system of ITU G.983.1, since the K1/K2 protection switching of ITU G.983.1 is defined by ITU-T G.783.

Regarding Claim 4, the combination of ITU G.983.1 and Klink discloses the OLT as claimed in claim 3, comprising: a PLOAM cell transmitter/receiver, a PLOAM cell being used for monitoring and being transmitted and received between the OLT and the ONUs (ITU G.983.1: page 41, section 8.3.5.9 and page 110, section IV.4); a dualized line termination device loading a PST message transmitter/receiver, which loads and divides switch controlling information to K1/K2 byte areas of said PLOAM cell (ITU G.983.1: page 60, section "PST Message", page 107, section IV.3.1 and figure IV.2 and page 41, section 8.3.5.9 and page 110, section IV.4); and a VP/VC (ITU G.983.1: Virtual Path/Virtual Channel) switch which switches a relevant VP or VC on the basis of said K1/K2 byte information (ITU G.983.1: page 106, section IV.2 and figure IV.1).

Regarding Claim 7, ITU G.983.1 discloses the ONU as claimed in claim 6, and discloses an ONU state table showing the functional behavior of the ONU (page 74, section 8.4.4.2.2 and Table 18), but does not disclose the switching decisions included in the state table. However, considering the teaching Klink described above for claim 3, it would have been obvious to one

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of ordinary skill in the art at the time of the invention to combine the teachings of ITU G.983.1 with those of Klink, as described above for claim 3, and further it would have been obvious to one of ordinary skill in the art at the time of the invention to then include the switching decisions in the ONU state table, based on the ONU receiving a switch confirmation requirement signal from the OLT, the OLT receiving a switch confirmation requirement response signal from the ONU, and the ONU subsequently receiving a switch requirement signal.

Regarding Claim 8, ITU G.983.1 discloses an ATM-PON dual system including an OLT, which is used for an ATM-PON, having a frame structuring means which load switching signals to unused K1 or K2 byte of a message area within a PLOAM cell, and a switch requirement transmitting means which requires line switch of ONUs by using K1/K2 bytes (page 41, section 8.3.5.9 and page 110, section IV.4), an ONU, which is used for an ATM-PON, being configured by dualizing the interval between said ONU and an OLT, having two line termination devices which terminate each line, a transmitting means which allocates signals from subscribers to said two line termination devices and transmits to said OLT, a receiving means which receives signals transmitted from the OLT at each line termination device (page 107, section IV.3.1 and page 109, fig. IV.2 (c)), and a plurality of optical couplers, being configured with a redundant interval between said OLT and said ONU (page 109 and fig IV.2 (c)), and receiving data at said ONU transmitted from said OLT, comprising: a switch controlling means which controls switching of said redundant system by using switch controlling information loaded on a fixed place of a frame format transmitted and received between said OLT and said ONU (page 41, section 8.3.5.9 and page 110, section IV.4). ITU G.983.1 does not explicitly show a selector at the ONU for selection of one of the two signals present on the ONU line termination devices. However, since the system is a "protection switching" system between two lines, it would have been obvious to one of ordinary skill in the art at the time of the invention that the ONU would



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have a selector to select the appropriate one of the two lines based on the switching information to obtain the active signaling. ITU G.983.1 discloses that the K1/K2 bytes are used as specified in G.783 for protection switching, but does not explicitly disclose that the K1 or K2 bytes are loaded with SC (Switch Confirmation requirement) signals and SR (Switch Requirement) signals. Considering the teaching Klink described above for claim 3, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of ITU G.983.1 with those of Klink, as described above for claim 3.

Regarding Claim 10, ITU G.983.1 discloses the ATM-PON dual method as claimed in claim 9, and requiring line switch of the ONUs by using said K1/K2 bytes within a PLOAM cell (page 41, section 8.3.5.9). ITU G.983.1 discloses that the K1/K2 bytes are used as specified in G.783 for protection switching, but does not explicitly disclose that unused K1 or K2 bytes are loaded with SC (Switch Confirmation requirement) signals and SR (Switch Requirement) signals. Considering the teaching Klink described above for claim 3, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of ITU G.983.1 with those of Klink, as described above for claim 3.

Regarding Claim 11, the combination of ITU G.983.1 and Klink discloses the ATM-PON dual method as claimed in claim 10, comprising the steps of: allocating signals from subscribers to said two line termination devices at the ONU and transmitting to said OLT (ITU G.983.1: page 106, section IV.2 and fig. IV.1); receiving signals transmitted from said OLT at each line termination device; and selecting signals of said line termination device (ITU G.983.1: page 109, fig. IV.2 (c) and page 110, section IV.4).

Regarding Claim 12, the combination of ITU G.983.1 and Klink discloses the ATM-PON dual method as claimed in claim 10, comprising a step of deciding necessity of switching the ONU according to existence of switch controlling information received at each line termination

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unit from the OLT (ITU G.983.1: page 41, section 8.3.5.9, page 60, section "PST Message" where the PST message with switching information is sent downstream to the ONU).

Regarding Claim 13, the combination of ITU G.983.1 and Klink discloses the ATM-PON dual method as claimed in claim 10, and discloses a state table showing the functional behavior of the ONU (ITU G.983.1: page 74, section 8.4.4.2.2 and Table 18), but does not disclose the switching decisions included in the state table. It would have been obvious to one of ordinary skill in the art at the time of the invention to include switching information in the state table of the combination of ITU G.983.1 and Klink as described above for claim 7.

Regarding Claim 14, the combination of ITU G.983.1 and Klink discloses the ATM-PON dual method as claimed in claim 10, comprising the steps of: broadcasting a frame containing a PLOAM cell which loads said switch controlling information to all of the ONUs connected to downstream (ITU G.983.1: page 60, section "PST Message" and "Broadcast message to all ONUs" and page 41, section 8.3.5.9); and deciding switch of a system within a relevant ONU according to existence of 0-system/1-system of switch controlling information of a PLOAM cell obtained from a frame by said each ONU (ITU G.983.1: page 41, section 8.3.5.9, page 60, section "PST Message" where Line Number "can be 0 or 1", where the PST message, with the line identifier, is part of the PLOAM cell sent from OLT to ONU, and used in protection switching).

Regarding Claim 15, the combination of ITU G.983.1 and Klink discloses the ATM-PON dual method as claimed in claim 10, comprising the steps of: transmitting a frame containing a PLOAM cell which loads said switch controlling information to a specified ONU connected to downstream; and deciding switch of a system within a relevant ONU according to existence of 0-system/1-system of switch controlling information of a PLOAM cell obtained from a frame by said each ONU (ITU G.983.1: page 41, section 8.3.5.9, page 60, section "PST Message" where

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Line Number "can be 0 or 1", where the PST message, with the line identifier, is part of the PLOAM cell sent from OLT to ONU, and used in protection switching).

Regarding Claim 16, the combination of ITU G.983.1 and Klink discloses the ATM-PON dual method as claimed in claim 10, comprising the steps of: allocating signals from subscribers to said two line termination devices at said ONU and transmitting to said OLT (ITU G.983.1: page 107, section IV.3.1 and page 109, fig. IV.2 (c)); receiving signals broadcasted from said OLT at each line termination device; and selecting signals of said line termination device (ITU G.983.1: page 110, section IV.4).

Regarding Claims 17 and 18, ITU G.983.1 discloses an ATM-PON dual method monitoring status of an interval between an OLT and an ONU by using a PST message, comprising the steps of: transmitting switch signals to an ONU connected to downstream all together (page 41, section 8.3.5.9 and page 60, section "PST message" sent from OLT to ONU, the PST message being a PLOAM cell message and used for switching), in case of detecting a line switching trigger at said OLT (page 106, section IV.2, where the fault detection is the trigger); and switching only a system of an ONU receiving said switching signal and deciding necessity of switching the ONU according to existence of switch controlling information received from the OLT (page 41, section 8.3.5.9 and page 60, section "PST message", and page 106, section IV.2, and figure IV.1; page 107, section IV.3.1; and page 109, Figure IV.2: (c)). ITU G.983.1 discloses that the K1/K2 bytes are used as specified in G.783 for protection switching, but does not explicitly disclose returning switch confirmation reply signals to the OLT. Klink discloses that ITU-T G.783 teaches the K1/K2 bytes used for protection switching, including a switching process between two terminals where altered K1/K2 bytes must be transmitted three times in succession between the two terminals for coordinating the switching (col. 1, lines 31-38). It would have been obvious to one of ordinary skill in the art at the time of the invention that

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the three successive K1/K2 transmissions defined in ITU-T G.783, as applicable to ITU G.983.1, would correspond to using a switch confirmation requirement signal, followed by a reply to the switch confirmation requirement signal, followed by a switch requirement signal, between the OLT and ONU of the K1/K2 switching bytes of the system of ITU G.983.1, since the K1/K2 protection switching of ITU G.983.1 is defined by ITU-T G.783.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over ITU G.983.1 [1998] (<http://crewman.uta.edu/~basu/5347spring2003/PON.pdf>) in view of Harstead et al. ("Harstead") (US Patent No. 6327400).

Regarding Claim 21, ITU G.983.1 discloses an ATM-PON dual method containing optical couplers branching and connecting an OLT and a plurality of ONUs, being configured with a redundant interval between said ONU and said optical couplers (page 107, section IV.3.1; page 109, Figure IV.2: (c); and page 110, section IV.4), and receiving data at each ONU transmitted from said OLT (page 106, section IV.2 and figure IV.1 and page 107, section IV.3.1 "Type C"). ITU G.983.1 does not disclose switching output lines by an optical switch provided at an output to an ONU side of said optical coupler. Harstead discloses an ATM PON system, including switching output lines by an optical switch provided at an output to an ONU side of an optical coupler (fig. 11 and col. 7, lines 46-62). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the configuration of ITU G.983.1 to switch output lines by an optical switch provided at an output to an ONU side of the optical coupler of ITU G.983.1, in order to provide the benefit of reducing interface redundancy requirements for the protection system, as taught by Harstead.

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***Response to Arguments***


9. Applicant's arguments with respect to claims 1, 3, 5, 8, 9, 14, 15, 17, 18 and 21 and depending claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

10. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pairedirect.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**M. R. SEDIGHIAN**  
**PRIMARY EXAMINER**